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AUTHOR Einsiedler, Wolfgang
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ABSTRACT

Two studies are presented which investigate the influence of various toy structures on the frequency of individual fantasy play forms in 3- to 6-year-old children. In the first study, the effects of high-realistic/high-complexity and low-realistic/low-complexity toy structures were compared. There were significant main effects for the factor toy and the factor age as well as a significant interaction of age X toy in various observational categories. In order to avoid a confusion of toy structures, a second study was conducted in which only the degree of reality was varied, and the degree of complexity was held constant. There were similar effects whereby the results for the fantasy play forms "object imitation" and "object transformation" were rather completely replicated. Differing results from the two studies were interpreted on the basis of the change in toy structure. Finally, the importance for child development of the fantasy play form "object transformation" and the "metacommunication" accompanying play is discussed, including consequences regarding the availability of toys in the home and at preschool. (Author/RH)

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Wolfgang Einsiedler

Fantasy Play of Preschoolers as a Function of Toy Structures

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Abstract

Wolfgang Einsiedler

Fantasy Play of Preschoolers as a Function of Toy Structures

Two studies are presented in which the influence of various toy structures on the frequency of individual fantasy play forms in 3 to 6 year-old children is observed. The appearance of various fantasy play forms is meaningful from a developmental psychological and from a pedagogical point of view because important functions in the development of social-cognitive abilities, for example symbolic thinking and perspective change, are attributed to fantasy play. Many studies have shown the gradual decontextualization of fantasy play between the 2nd and 6th years of life, i.e. older children were better able to play with non-realistic toys than younger ones. In most work on this subject, the children received defined play tasks. The goal of our studies was, however, to analyse the appearance of spontaneous play actions with realistic and non-realistic toys in order to draw conclusions about the natural play of children.

In the first study, the effects of high-realistic/high-complexity and low-realistic/low-complexity toy structure were compared. There were significant main effects for the factor toy and the factor age as well as a significant interaction age x toy in various observational categories. In order to avoid a confusion of toy structures, a second study was conducted in which only the degree of reality was varied and the degree of complexity was held constant. There were similar effects whereby the results for the fantasy play forms "Object Imitation" and "Object Transformation" were rather completely replicated. Differing results of the two studies were interpreted on the basis of the change in toy structure.

Finally, the importance of the fantasy play form "Object Transformation" and the "Metacommunication" accompanying play for child development is discussed, including the consequences in regard to the availability of toys in the home environment and in preschool facilities.

Since Karl Bühler's work (1918), fantasy play has been assigned an important function for child development; Bühler, who also speaks of "illusion play", says that the child acquires intellectual abilities, behaviours, as well as emotions and moods during this play (1918, p. 326). Later, Piaget (1945) described children's fantasy play in detail, ordering it among the assimilation activities and describing it as a way to consolidate symbolic thinking; for this reason he called it "symbolic play". Recently the concept has been prevalent that fantasy play not only consolidates cognitive schemes, but also contributes to the development of new schemes, for example, abilities in relation to problem-solving and perspective taking (Rubin & Pepler, 1982); according to Bretherton (1984), fantasy play generates action plans, so-called maps and scripts, and the ability to develop various alternative actions in every-day life.

In empirical research the developmental function of fantasy play has been relatively well documented. There have been studies in which the improvements of IQ have resulted from training in thematic fantasy play (Saltz, Dixon & Johnson, 1977). Effects of fantasy play on creativity, as well as on visual, cognitive, and affective perspective-taking, have also been found (Dansky, 1980; Burns & Brainerd, 1979). Clair Golomb was able to show in several ways that fantasy play contributes to the development of the conservation concept (Golomb & Cornelius, 1977; Golomb & Bonen, 1981; Golomb, Goranson Gowing & Friedman, 1982); she assumes that object transformations during fantasy play and conservation transformations are similar. Various studies attribute improvements in linguistic and metalinguistic competence to fantasy play (Garvey 1974; Lovinger, 1974; Corrigan, 1982, Griffing et al., 1983). These results are an important prerequisite for our own studies because, from our observations of the frequency of transformations during fantasy play, we can draw conclusions about cognitive activities of children. It must be mentioned, of course, that some questions in these research programs are still unanswered, e.g. about the influence of adults and the difference between free play and play training, among others (compare Christie & Johnsen, 1983).

The development of fantasy play in childhood is characterized by increasing decontextualization (Fein, 1979): In the beginning the child plays by using its body. In order to generate a fantasy situation, it must rely on highly realistic objects. Later the objects can be less realistic, exist for a different purpose, or the child symbolizes an action without supporting material. In many studies there was a transition, between the ages of two and four, from dependence on highly realistic toy objects to the gradual ability to imagine certain acts of play with non-realistic objects (Fein, 1975; Elder & Pedersen, 1978; Ungerer et al., 1981; Corrigan, 1982).

In most studies concerning gradual decontextualization of fantasy play, however, spontaneous appearance of fantasy play is not investigated but rather play tasks with certain solutions are presented (compare, for example, Pedersen, Rock-Green & Elder, 1981; Crum et al., 1983; Bretherton et al., 1984; Mann, 1984), or the children are supposed to imitate certain model actions of adults (compare, for example, Watson & Jackowitz, 1984). Mostly the children play a fantasy situation with realistic materials (e.g. a dinner scene with dishes), followed by the task of playing the same scene with less realistic material (e.g. blocks), with inappropriate material (e.g. toy cars as dishes) or without play material. This procedure is proper if one wants to describe how children of increasing age represent cognitively. However, the question is just as important as to what forms of fantasy play appear when no play task with a certain solution is assigned, but rather the children play spontaneously, or at least relatively so. Only with studies based on this question statements can be made about the actual frequency of forms of fantasy play in natural situations. Under the assumption that cognitive representations emerge during fantasy play, conclusions can be drawn about cognitive processes and the stimulation of development during free child play.

Similar to the studies of decontextualization, we offered different varieties of toys, only differentiating between high-realistic and low-realistic toy structure, and giving the children opportunity to use material in ways contrary to its purpose, or to conduct fantasy play without material. In a first study, we combined the degree of reality with the degree of complexity of the toy structure. This dimension seems important to us, because the hypothesis has been discussed for a long time in play theory that high-complexity toys negatively influence child play and low-complexity toys stimulate more fantasy activities. Our question is: How often do various fantasy play forms appear

with a high-realistic/high-complexity toy structure in comparison to a low-realistic/low-complexity toy structure? The confluence of degree of reality and degree of complexity had disadvantages, however, so that we held the degree of complexity constant in a second study and only varied the degree of reality. On the basis of both studies we then attempted to answer the question: What conclusions can be drawn from the different frequencies of fantasy play forms as a result of the independent variables toy structure and age for assumptions about cognitive processes during fantasy play?

STUDY 1

Method

Subjects and design: We conducted an experimental study with two age groups and two play conditions. The subjects were 48 kindergarten children between the ages of 3 and 6, living in the suburb of a large city, belonging to the middle class. The children were divided into two age groups and then randomly divided according to play condition as follows:

Play condition 1/Older children: 12 children, average age 5 years, 9 months
Play condition 2/Older children: 12 children, average age 5 years, 8 months
Play condition 1/Younger children: 12 children, average age 3 years, 10 months
Play condition 2/Younger children: 12 children, average age 3 years, 11 months.

The children played in pairs, with 13 pairs of mixed sex and 11 pairs of the same sex.

The two different play conditions were as follows:
Toy structure 1 was high-realistic/high-complexity and consisted of the plastic Playmobil sets "Farmhouse" and "Camping Bus". A high degree of realism was achieved through clear shape of the play figures and the accessories (comparable to Fisher Price sets). High complexity was achieved through the greater number and variety of the materials and objects than in toy structure 2 (farm family, camping family, animals, tools and many others).
Toy structure 2 was low-realistic/low-complexity and consisted of sections of wood, coloured wooden cubes, sticks and a piece of cloth. A lower degree of reality meant here that the materials were not comparable to any real objects in every-day life. A low degree of complexity was determined by the smaller number of objects and the simplicity of the materials. In order to indicate the possibility of play with human roles, five Playmobil figures were included.

Procedure: The children were observed for 25 minutes with the observation instrument described below. During the play phase the observed behaviour was noted every 30 seconds, so that there are 50 observational values for every child. Two assistants conducted an observer training session before the study using video recordings of fantasy play scenes and for the most part achieved observer agreement of approximately 90 %.

The observational instrument includes 8 categories[1], with which behaviours were categorized:

(1) **Conversation about the play (Metacommunication):** The child speaks about the situation or about the objects without projecting himself into a fantasy situation; children discuss the play, make corrections, among others.

(2) **Verbal Representations of Fantasy Actions:** The child creates a fantasy situation by describing verbally a situation, suggesting a topic or carrying out imaginary activities. Category 2 is differentiated from category 1 by further indicators and examples.

(3) **Role Taking:** The child assumes the role of a human being (e.g. mother, farmer, nurse). In contrast to category 2, which is for the most part characterized by statements in the third person, sentences in the first and second person belong to category 3.

(4) **Object Imitation:** The child imagines being an animal or an object, or using an object. Reification (e.g. "Here is coffee in the cup.") and the use of replicas (e.g. using a toy telephone correctly) belong to category 4.

(5) **Object Transformation:** The child gives the object a different significance. The object (the signifier) replaces an imagined object (the signified). Substitutions in the real sense (e.g. using a block as an airplane) are included in this category.

(6) **Non-Fantasy Play / Motoric Activities**

(7) **Looking on / Talking**

(8) **Unoccupied**

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[1] The detailed observation manual with definitions, indicators and examples can be requested from the author.

As in the case of categories 1-5, exact descriptions and examples of categories 6-8 are included.
The stucy was conducted in the play corner of a room in the kindergarten which was well-known to the subjects, and which the other children had left. Before the actual observation phase, 10 minutes were allotted for familiarization with the materials. In this way exploration behaviour, which would otherwise have been confused with play, was controlled (Christie & Johnsen, 1983).

Results

2 x 2 variance analyses with the factors toy structure and age were calculated for the values of each observation category (see Table 1). The value $\hat{\omega}^2$ was calculated as the measure of "practical significance" (compare Bredenkamp, 1970), which estimates the contribution of the independent variables to the explanation of variance in the dependent variables (Eimer, 1978, pp. 88 f.).

Table 1: see page 5 a

As Table 1 shows, the category "Metacommunication" reveals a significant main effect for toy structure. The children playing under the condition of toy structure 2 (low-realistic/low-complexity) more frequently conducted metacommunication. We attribute this to the fact that the materials in toy structure 2 suggest no special play themes; there are more conflicts and the children have to agree more frequently on play topics and roles (compare Rubin, 1980). The children alternate between the fictitious level of fantasy play and the level of the real play situation; according to Garvey (1974; 1977) and Golomb (see first section), these alternations develop linguistic abilities and reversibility in thinking.

For the category "Verbal Representation of Fantasy Actions", there were no significant differences.

Under the category "Role Taking" there is a significant main effect with age: The older children more often played roles than the younger children. This result conforms to findings of Sanders & Harper (1976) as well as Rubin, Watson & Jambor (1978) and confirms previous statements according to which the ability to assume roles developes mainly towards the end of preschool and in middle childhood.

Table 1: Results of the 2 x 2 variance analyses (Study 1)

Dependent Variable	Effect	F	p	$\hat{\omega}^2$
1. Metacommunication	Toy Structure 2 > Toy Structure 1	4.47	.040	.07
2. Verbal Representations of Fantasy Actions	No significant differences	-	-	-
3. Role Taking	Older > Younger	6.65	.013	.11
4. Object Imitation	Toy Structure 1 > Toy Structure 2	82.45	.000	.64
5. Object Transformation	Toy Structure 2 > Toy Structure 1	60.68	.000	.49
	Older > Younger	11.49	.002	.09
	Age x Toy Structure Interaction	5.94	.019	.04
6. Non-Fantasy Play / Motoric Activities	Toy Structure 2 > Toy Structure 1	41.85	.000	.43
	Younger > Older	6.50	.014	.06
7. Looking on / Talking	No significant differences	-	-	-
8. Unoccupied	No significant differences	-	-	-

Toy Structure 1 = high-realistic/high-complexity
Toy Structure 2 = low-realistic/low-complexity

For the category "Object Imitation" we found a highly significant main effect in the toy structure factor. Under toy structure 1 (high-realistic/ high complexity) children imitated much more frequently the actions of vehicles, animals and objects. The $\tilde{\omega}^2$ estimate yields the result that toy structure explains 64 % of the variance in this fantasy play form. Bretherton et al. (1984) list a whole series of studies with similar findings and explain further: "Infants appear to be more willing to imitate schemes, modeled with prototypical rather than nonprototypical objects" (p. 275). In the case of low-realistic objects, in contrast, appropriate imitative schemes were not so easy to call up.

The most interesting results were obtained in the category "Object Transformation": The evaluations showed a highly signifcant main effect for toy structure, a highly significant main effect for age and a significant interaction age x toy structure.
The analysis of the significant ordinal interaction shows (see Figure 1) that the effect of the factor toy structure on the two levels of the factor age is not the same: While toy structure 1 (high-realistic/high-complexity)

Figure 1: see page 6 a

shows no difference between the two age groups, the older children showed a significantly greater number of object transformations under toy structure 2 (low-realistic/low-complexity) than the younger ones. The significant main effect for the factor age is therefore mainly a result of the clear mean difference between the younger and older children under toy structure 2 (low-realistic/low-complexity). The significant main effect of the factor toy structure makes clear that condition 1 (high-realistic/high-complexity) leads to considerably fewer object substitutions in both age groups. The reinterpretation of objects, which, according to Piaget (1945), is the real substance of fantasy play and necessarily leads to cognitive representations, almost fails to appear completely under toy structure 1, $\bar{x} = 0.67$, and under toy structure 2 it has a mean of $\bar{x} = 6.13$.
Under category 6, toy structure 2 leads to higher values, whereby the non-fantasy play consisted mainly of building. Additionally, there is an age effect: Younger children more often showed non-fantasy play activities than older ones. This result is in conformance with the evaluations in categories

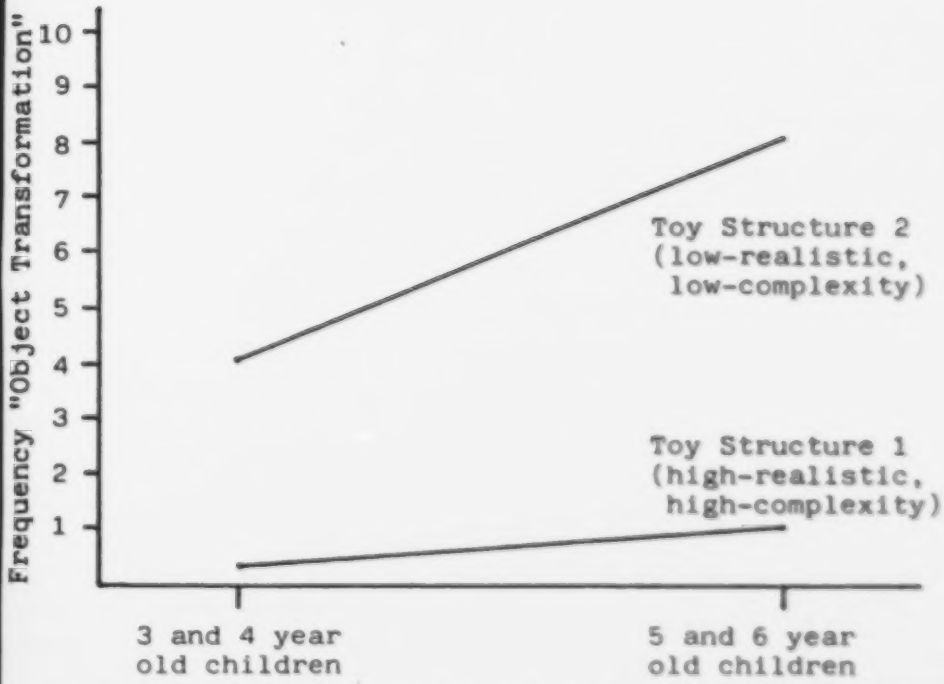

Figure 1: The significant age x toy structure interaction in category 5 ("Object Transformation")(Study 1)

3 and 5. In categories 7 and 8 there were neither significant main effects nor interactions.

STUDY 2

Method

Subjects and Design: As in study 1 48 children of a kindergarten in a middle-class suburb were distributed in two age groups and then randomly divided according to play condition. This time the two groups of older children had an average age of 5 years, 7 months and 5 years, 6 months, and the two groups of younger children 4 years, 2 months and 4 years. Again the children played in pairs, with 8 of mixed sex and 16 of the same sex.

In this study we varied only the degree of reality of the toys. Play condition 1 again consisted of the plastic Playmobil set "Farmhouse" with highly realistic objects, play figures and animals. In this study, play condition 2 used a wooden play set "Farmhouse" (Habermaaß), available in trade. As far as the size of the house, the play figures, and the animals are concerned, the material is comparable to Playmobil. However, the wooden play set has a low degree of reality: the materials are greatly stylized, body parts and tools are not as clearly formed, and the play figures and animals are uniformly coloured, without imprints of faces or other characteristics; the farm set consists of simple wood blocks without a realistic representation of doors, bricks, etc. We attempted to maintain the complexity in both toy structures at a medium level by providing approximately the same number of classes of play materials (human beings, animals etc.) and, in each class, approximately the same number of objects.

Procedure: The procedure for the study was exactly the same as in study 1. The same observational instrument with 8 categories and notation every 30 seconds was used. Two assistants again practiced the observation of fantasy play with video tapes until they achieved an observational agreement of 90 %. Prior to actual observation, the children played for approximately 10 minutes to become familiarized with the material (exploration constant).

Results

In the category "Metacommunication", there was a very significant main effect for age: Older children conducted more metacommunication conversation than younger ones. As this effect does not appear in study 1, because younger children in the low-realistic/low-complexity play condition conducted many metacommunication conversations, it appears that the maintenance of a medium degree of complexity in study 2 reflects the general increase of metacommunicative abilities.

Table 2: see page 8 a

In the category "Verbal Representations of Fantasy Actions" there are significantly higher values for the children in play condition 1 (high-realistic). This effect is unexpected, because we supposed that more verbal support of fantasy play would be necessary with low-realistic toys. Obviously the realistically shaped play figures and objects stimulate more story-telling conversations, such as "The farmer is feeding the animals".

In the category "Role Taking", the mean of the older children, as in study 1, is higher, but the trend is not significant, $F = 2.77$; $p = .10$. We cannot conclude that there is any further importance in this trend since the interaction between age and toy structure proved to be significant and the four cell means point to a so-called disordinal interaction. A more exact analysis of the interaction effect described here with the aid of the caluculation of simple main effects shows, however, that there is only an age effect for toy structure 2 (low-realistic): Older children here played significantly more often than younger ones ($F = 7.24$; $p < .025$). Younger children who, from a developmental psychology point of view, play fewer roles than older ones, have difficulties assuming new roles with stylized material. Beyond that, the other mean differences are only random.

Under "Object Imitation", the evaluation shows results which are identical with those of study 1. The children playing in toy structure 1 conducted a significantly greater number of object imitations. As in study 1, the values for toy structure 1 are many times higher than the values for toy structure 2. The more frequent use of imitative schemes on the basis of clearly shaped toys was confirmed.

Table 2: Results of the 2 x 2 variance analyses (Study 2)

Dependent Variable	Effect	F	p	$\hat{\omega}^2$
1. Metacommunication	Older > Younger	8.88	.005	.14
2. Verbal Representations of Fantasy Actions	Toy Structure 1 > Toy Structure 2	8.20	.006	.13
3. Role Taking	Age x Toy Structure Interaction	4.58	.038	.07
4. Object Imitation	Toy Structure 1 > Toy Structure 2	16.97	.001	.24
5. Object Transformation	Toy Structure 2 > Toy Structure 1	23.28	.001	.23
	Older > Younger	15.68	.001	.15
	Age x Toy Structure Interaction	11.75	.001	.11
6. Non-Fantasy Play / Motoric Activities	Toy Structure 2 > Toy Structure 1	16.39	.001	.19
	Younger > Older	15.47	.001	.18
7. Looking on / Talking	Younger > Older	5.39	.025	.03
8. Unoccupied	Age x Toy Structure Interaction	6.50	.014	.10

Toy Structure 1 = high-realistic
Toy Structure 2 = low-realistic

Similar to the first study, the second study also showed highly significant main effects in regard to the dependent variable "Object Transformation", as well as a highly significant (ordinal) interaction effect age x toy structure (see Figure 2). In play condition 2 (low-realistic) older children more often transformed objects into fictitious objects than younger children, while toy structure 1 (high-realistic) resulted in no difference in object

Figure 2: see page 9 a

transformation in the two age groups. This fairly well replicates the results of the first study. On the whole the means for object transformation in toy structure 1 (high-realistic) were lower than in toy structure 2 (low-realistic). On the basis of the ordinal interaction shown, the effect of play condition 1 in comparison to play condition 2 can only be described satisfactorily in relation to the levels of the factor age. The calculation of simple effects shows that the highly significant main effect for the factor toy structure can only be a result of the different behaviour of the older children under the two play conditions; in play condition 2 (low-realistic) a significantly higher mean was calculated ($F = 34.06$; $p < .025$). The difference between the means of the younger children in the two toy structure conditions is, in contrast to study 1, random. The plausible assumption that realistically shaped toys are seldom used for the symbolization of invented play actions appears to be confirmed only for the older children. According to Pederson et al. (1981), not only the similarity of toys with real objects in highly realistic material prevents object transformation, but also, above all the action quality of the toy (e.g. driving toy cars, cutting with a toy knife).

In the category "Non-Fantasy Play" toy structure 2 again produced higher values than toy structure 1. The younger children more often conducted non-fantasy play than the older children.

In the case of a decidedly non-play category, namely "Looking on / Talking" we also found an age-effect. Finally, there was a significant interaction age x toy structure in the category "Unoccupied". Older children were more often unoccupied in toy structure 1 than younger children.

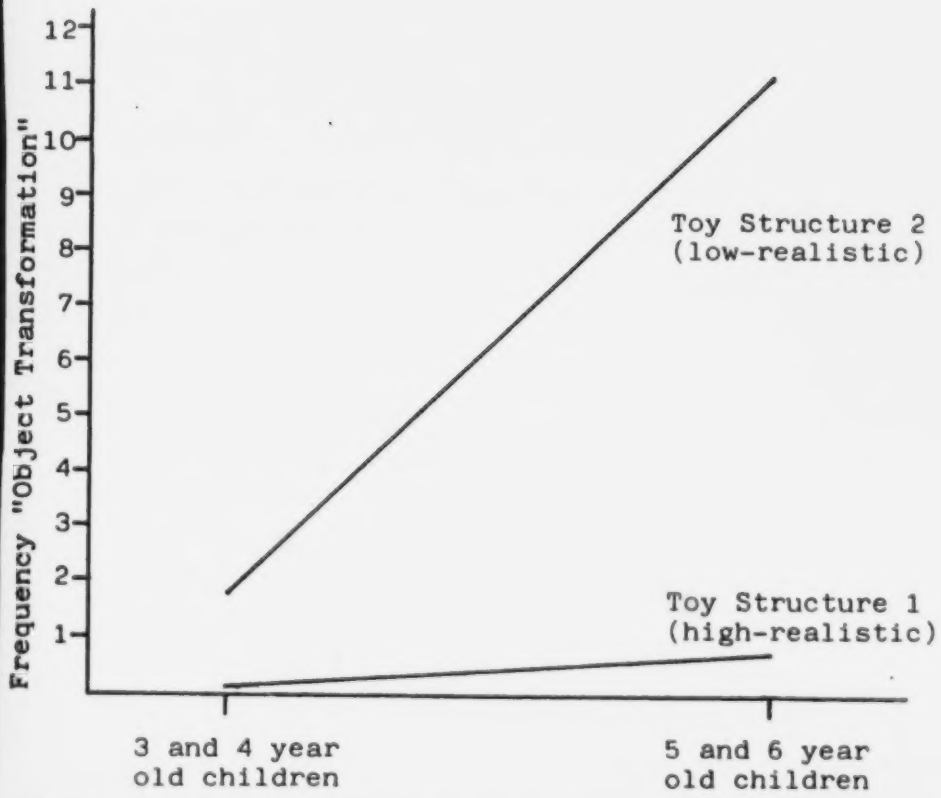

Figure 2: The significant age x toy structure interaction in category 5 ("Object Transformation")(Study 2)

DISCUSSION

In our studies, the influence of toy structure in the form of different degrees of reality and complexity on the fantasy play of 3 to 6 year-old children was shown. The age of the children also proved to be an influential factor. In the areas of the fantasy play forms "Object Imitation" and "Object Transformation" we were able to replicate the results rather well. In both studies toy structure 1 led to a significantly higher frequency of object imitation than toy structure 2, and in both studies toy structure 2 stimulated a significantly higher number of object transformations than toy structure 1, whereby the older children with their different behaviours were mainly responsible for this effect. The illustrations of the interactions age x toy structure, which show the fact that older children undertake more object transformation in toy structure 2, are almost identical for both studies. The significant mean difference between toy structure 1 and 2 could not be replicated for the younger children. We interpret the great frequency of object imitation in toy structure 1 with the supporting function of realistic materials, and also with the challenging nature of the toys used (compare the significantly longer play times with highly realistic objects in McGhee, Ethridge & Benz, 1984). To a great extent the children played out the thematic situations and actions involving the animals and objects as the play sets were designed to suggest, and rarely introduced other, less realistic ideas (compare Pulaski, 1973). Presumably the action orientation of the highly realistic material limits the production of self-generated fantasy themes, or - as Pederson et al. (1981, p.759) express it -: "For the young child the powerful motivating force of objects to elicit actions limits the child's ability to engage in actions generated and controlled by ideas."

If, from a pedagogical perspective, we are of the opinion that it is important to support the generation of independent play ideas and the transformation of existing objects into fictitious ones in children, then children, mostly the older ones, should be offered to a great extent low-realistic, unstructured, simple materials in the home environment and in preschool facilities. This reasoning is supported further by the findings, cited at the beginning, that frequent object transformations lead to an improvement in representational thinking and reversible thinking.

In the area of metacommunications accompanying play, the change in toy structure from study 1 to study 2 led to a change in the results. In study 2, in which the complexity was kept constant at a median level, there was a highly significant age effect. We assume that the conditional effect in study 1, with the combined toy structure degree of reality/degree of complexity results mainly from the different degrees of reality. The very low-realistic blocks and sticks required more metacommunications in order to achieve a common play theme and unified play action. The somewhat higher degree of reality of the wooden farm house, the wooden figures and animals in study 2 did not necessitate these discussions about play topics and actions to the same extent.

The main effect of the age factor in the play category "Role Taking" in study 1 (older children assuming more roles) changed to a specific interaction effect in study 2: A clear increase in role taking based on age was only observed in toy structure 2; the younger children played less role taking with low-realistic materials than the older children. For the high-realistic toy structure this was no longer true. We can tentatively draw the conclusion that, because of the lower number of supporting materials in study 2, the older children were more strongly dependent on the play figures which stimulated play with human roles.

While the results concerning "Object Imitation" as well as "Object Transformation" are well proven and agree with findings from other studies (compare , for example, McGhee et al., 1984), the statements about "Metacommunication", "Role Taking" and the other fantasy play forms and their accompanying processes have to be better substantiated empirically in further studies. But the results in regard to "Object Imitation" should also be interpreted cautiously. We cannot say simply that object imitations require less imagination and simpler representations than object transformations. We cannot exclude the possibility that the imitation of noises (e.g. chopping wood) and the use of replicas (e.g. imitatively using dishes) in some children is accompanied by reification (e.g. imagined wood, imagined cake), which would be connected with the representational thinking. In further studies it would be better if noise imitations, the use of replicas and reification were observed separately, which, however, would probably not be easy. A possibility would be to specifically provoke an individual play form,

such as the use of replicas, and note cognitive effects in experimental comparisons. In such isolated procedures, however, we would be exposed to the criticism of lack of external validity. The free fantasy play of children is especially characterized by holism and smooth transitions between various play forms as well as non-play.

The meaning of high-realistic/high-complexity as well as low-realistic/low-complexity toy structures would be emphasized for prescriptive play-pedagogic conclusions. Play with a high degree of realism stimulates more strongly play within the thematic areas intended by the material; new play ideas are developed less frequently and imitative activities are in the foreground. In spite of that it would be wrong from a play-pedagogical point of view to reject play with realistic objects generally. The clearly imprinted play figures can stimulate role taking and thereby further the ability to change perspectives. According to Fein (1981, p. 1108), play with realistic materials is especially recommended for children who still have limited representational capacity, and who might otherwise not conduct fantasy play at all. According to our results, however, object transformations with independent play ideas and metaconversations appear more frequently in toy structures of low reality and complexity, whereby great meaning for social-cognitive development can be assumed for this fantasy play form as well as for the accompanying linguistic processes.

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